


The Journal of the American Association of Zoo Keepers, Inc.

Animal Keepers' Forum



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37 ABOUT THE COVER

38 FROM THE PRESIDENT

40 COMING EVENTS

41 ANNOUNCEMENTS

FEATURED ARTICLES

42-49

**How to Build a Better Zoo –
Look to the Keepers**

Robin Sutker

50-54

**Captive Bat Management
Turned Upside Down**

Eran Brusilow, Nick Milone, and Susan Wiebe

INTERNATIONAL OUTREACH

56-57

AAZK Sponsored Memberships

**Providing Resources to our
Latin American Colleagues**

Yvette Kemp

SAFETY

58-61

Safety During Training



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The American Association of Zoo Keepers, Inc. exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

ABOUT THE COVER

This month's cover photo was taken by Brittney Powers at Bearizona Wildlife Park which focuses on North American wildlife in large, naturalistic habitats. They currently house a non-breeding pair of bobcats, Sig and Remington. Bobcats are found throughout most of North America and are adaptable predators, hunting in semi-desert, forest edge, swampland, and wooded areas. Preferred prey depends on location and season. Bobcats tend to go after rabbits and hares, but will also hunt chicken, geese, and small rodents. The bobcat resembles two other members of the genus *Lynx*, but is the smallest member, reaching an average size of 21 lbs for males and 15 lbs for females. The ears are black-tipped and pointed, with short, black tufts, and its spotted patterning acts as camouflage. Bobcats in the desert regions of the southwest have the lightest-colored coats, while those in the northern, forested regions are darkest. The bobcat is crepuscular, and is active mostly during twilight. This behavior may vary seasonally, as bobcats become more diurnal during fall and winter in response to the activity of their prey, which are more active during the day in colder weather.

While currently listed as Least Concern by the IUCN, hunting and trading must be closely monitored to ensure a healthy and thriving population.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone (330) 483-1104; FAX (330) 483-1444; e-mail is shane.good@aazk.org. If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: aazk.org/akf-submission-guidelines/.

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*Look around
with fresh eyes
and take in the
details.*

I recently had the opportunity to visit a local AZA accredited facility, which is something that I try to do several times per year, in addition to visiting some great facilities during Zoo Day at the AAZK National Conference annually. During this recent visit, I put an emphasis on looking at my surroundings through a new lens. I appreciated the time spent viewing exhibit design and plantings. I noticed important details within the exhibit signage, and even learned some new things!

I took care to not just focus my attention on the animal aspects of the visit, as I believe many of us tend to do. I also enjoyed the interaction with facility staff, both in animal care and other departments, as I passed them on the pathways or in the non-animal areas such as the gift shop. Despite the winter weather and having to work during the holiday season, they were all very engaging and contributed to my overall experience.

As we begin to settle into this New Year, I encourage you to visit other facilities, whether local or far from home, if the opportunity presents itself. Look around with fresh eyes and take in the details. Take the opportunity to network with the staff and engage with your peers. It might just be the recharge you need, at the right time.

I'd love to hear from you.

Warm Regards,

Bethany

Bethany.Bingham@azk.org



Who doesn't love lions in the snow? Photo by Jill Dignan, Lincoln Park Zoo.

COMING EVENTS

Post upcoming events here!
e-mail shane.good@aazk.org

March 21-22, 2019

2nd Annual Texas AAZK Regional Symposium

Dallas, TX
Hosted by Dallas AAZK Chapter and AZVT Southwest Region.
To register visit <https://azvt.org/Regional-Conference/>

April 9-10, 2019

Ape Cardio Workshop

Waco, TX
Hosted by Cameron Park Zoo
For more information go to: greatapeheartproject.org/cpzworkshop/

April 13-18, 2019

AZA Mid-Year Meeting

Phoenix, AZ
Hosted by Phoenix Zoo
For more information go to: aza.org

May 20-23, 2019

International Giraffid Conference

Hosted by the Columbus Zoo and Aquarium.
For more information go to: <https://reservations.columbuszoo.org/info.aspx?ActivityID=1875>

May 22-24, 2019

Chimpanzee SSP Husbandry Workshop

West Palm Beach, FL
Hosted by Lion Country Safari
For more information contact: jennifer.ireland@nczoo.org

July 13-19, 2019

Felid TAG:
Husbandry Courses - July 13-15
SSP Meetings - July 15-16
TAG Meetings - July 17-19
Omaha, NE
Hosted by Omaha's Henry Doorly Zoo and Aquarium
More information coming soon!

July 22-26, 2019

Prosimian TAG Husbandry Workshop and Mid-year Meeting

Hosted by the Dallas Zoo
Three day workshop followed by TAG meetings
For more information contact: PTAG2019@dallaszoo.com

August 26-28, 2019

Orangutan SSP Husbandry Workshop

Fort Wayne, IN
Hosted by the Fort Wayne Children's Zoo
For more information go to: <http://www.orangutanssp.org/2019-workshop.html>

September 7-11, 2019

AZA Annual Conference
New Orleans, LA
Hosted by Audubon Zoo and Audubon Aquarium of the Americas
For more information go to: aza.org



August 18-22, 2019

AAZK National Conference

Indianapolis, IN

Hosted by Indy AAZK and the Indianapolis Zoo

www.indyaazk.org

September 30 - Oct. 4, 2019

New World Primate TAG Husbandry Workshop

New Bedford, MA
Hosted by Buttonwood Park Zoo
For more information go to: https://www.speakcdn.com/assets/2332/nwptag_save_the_date_v15.jpg

2019 AAZK AWARDS NOMINATIONS OPENED



The American Association of Zoo Keepers AAZK Awards Committee is accepting nominations for The AAZK Lifetime Achievement Award, The AAZK Meritorious Service Award, The AAZK Lutz Ruhe Professional of the Year Award, The AAZK Jean M. Hromadka Excellence in Animal Care Award, The AAZK Excellence in Animal Nutrition Award, The AAZK Excellence in Exhibit Renovation Award,

The AAZK Excellence in Zoo Keeper Education Award, The Nico van Strien Leadership in Conservation Award, and the Lee Houts Advancement in Enrichment Award which will be presented at the 2019 AAZK Conference in Indianapolis, IN. The deadline for nominations is May 1, 2019. Information concerning the qualifications, nomination procedure, selection procedure and an explanation of the awards may be obtained at www.aazk.org, under committees & programs/awards committee.

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How to Build a Better Zoo – Look to the Keepers

Article and Photos: Robin Sutker

robin.sutker@aazk.org

Committee Chair, American Association of Zoo Keepers Resource Committee (ARC)

Zoology Graduate Student, Global Field Program of Project Dragonfly, Miami University Ohio

Infographics: Jenny Eischen

Committee Member, American Association of Zoo Keepers Resource Committee (ARC)

All species, including humans, rely on resources for survival and exist in a constant search for adequate quantities. The Merriam-Webster dictionary (n.d.) defines a resource as anything that is a “source of supply or support” for an organism or organization: food, water, money, or even education. The latter, specifically conservation education, is crucial for all people in the anthropogenic age, where humans make many of the decisions that either protect or destroy the natural world. A well-known embodiment of this notion was coined by Baba Dioum in 1968, at a meeting of the General Assembly of the International Union for the Conservation of Nature and Natural Resources (IUCN): “In the end, we will conserve only what we love; we will love only what we understand and we will understand only what we are taught.”

This quote encapsulates both the ideals of conservation education and modern zoos and aquariums, which have transformed over recent decades into a public resource for wildlife education. More than 700 million people visit zoos and aquariums (Gusset & Dick, 2011) - or “zooquaria” (Parker, 2014) - around the world annually; a sum greater than any other tourism venue. As such, zooquaria have an obligation to utilize their resources effectively while engaging their guests with the natural world. This is crucial for conservation education as the connections made by zooquaria visitors can ultimately drive individual pro-conservation behaviors such as recycling or sustainable product purchases (Skibins, Powell,

& Hallo, 2013). Second to these institutional-based influences is the work that is supported by the revenue of the zooquaria: *in situ*, or in the field, conservation projects. In order to continue conservation field work it is essential for zooquaria staff, keepers in particular, to stay well-informed on global conservation issues to engage with guests and supplement formal conservation education.

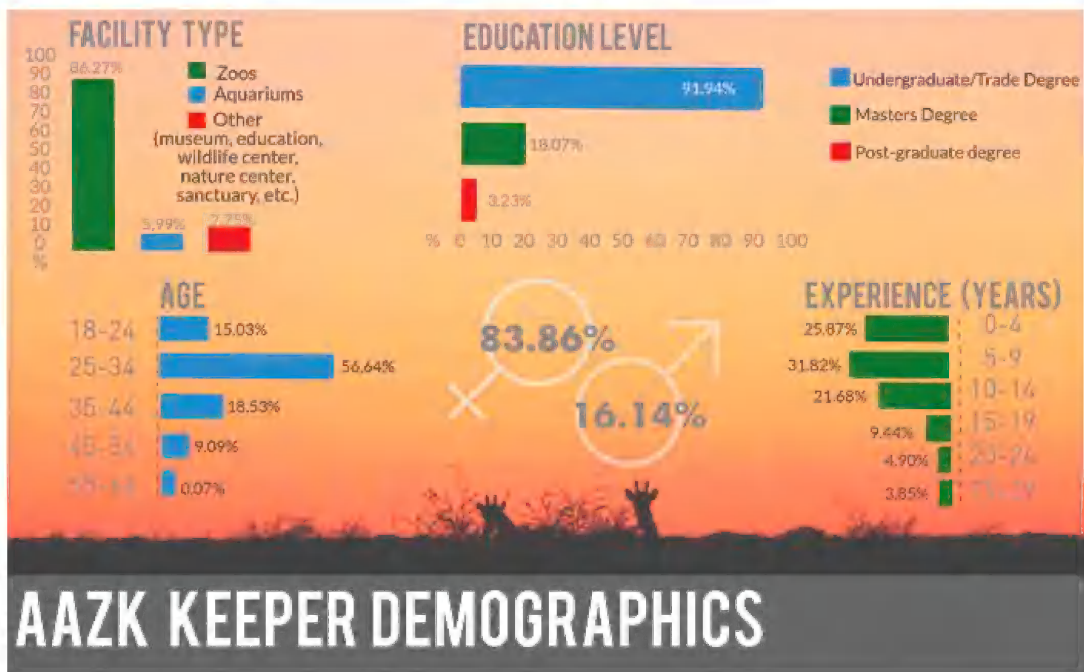
Zoo Keepers: Working Hard for Wildlife

The American Association of Zoo Keepers (2016), North America’s largest organization solely for zooquaria animal care professionals, defines a zoo keeper as, “an individual who cares for animals in zoological parks or aquariums”. The job is widely considered “dirty-work,” thankless, and offers little opportunity for “hierarchical advancement beyond head keeper (Bunderson & Thompson, 2009),” due to the number of people required for the intense physical husbandry. Zoo keepers clean, feed, medicate, enrich, record, report, and perform countless other duties in their daily routines; all while spending more time with the animals than any other staff member (Irwin, Stoner, & Cobaugh, 2013). However, job requirements and on-the-job resources – defined as (but not limited to) professional development, continuing education, and grants - vary considerably between institutions and seniority.

Nonetheless, most contemporary zoo keepers, like modern zooquaria, do participate in the best practices of animal welfare (Whitham & Wielebnowski, 2009) and maintain strong relationships with the animals they care for (Carlstead, 2009), while working for a “sense of significance... viewed as one’s calling (Bunderson & Thompson, 2009)” rather than economic gain. Some zoo keepers lead or assist in data collection for both *in situ* and *ex situ* (or institution-based) research of nutrition, emergent diseases, rehabilitative medicine, community-based conservation, and conservation legislative work (Irwin, Stoner, & Cobaugh, 2013). With a position at the forefront of animal care, keepers have the opportunities, but not necessarily the resources (grants, knowledge, and/or facility support), to make larger contributions - especially as the line between *in situ* and *ex situ* conservation field work continues to blur and species face greater threats in an ever-shrinking wild (Minteer & Collins, 2013).

The Perils of the Modern Zoo Keeper

When considering the role of the modern-day zoo keeper, history must be taken into consideration. Zooquaria today are a departure from strict entertainment menageries (Rabb, 2004), only existing for little more than a century, and yet the “modern zoo keeper” has existed for far less than that. It can be suggested that zoo keepers have taken a similar albeit



slower trajectory than zooquaria; thirty years ago keeper applicants needed no more than a high school diploma. However, as of 2010, 82% of keepers held four-year degrees, maintained ever-expanding knowledge of wildlife, and were constantly pushing the boundaries of husbandry, veterinary medicine, and conservation (Good, 2010).

Nevertheless, with endless on-the-job-learning, limited funding, and priorities aimed at the highest level of animal welfare, little research has been conducted on keepers or the educational and monetary resources they need to grow as conservation professionals - let alone to further the evolution of the zooquaria field. Even the largest accrediting agency for zooquaria in the United States, The Association of Zoos and Aquariums (AZA), does not collect zoo keeper demographics. In fact, as of 2017 AAZK could only account for its 1,702 professional members (Hansen) - whereas anecdotal reports estimate around 10,000 individuals. Furthermore, across the board keeper resources are scarce and disorganized. Without knowing vital information about the

keeper population, it seems impossible to provide adequate resources and extinguish employee burnout - another little-researched zooquaria topic.

A previous study revealed that zooquaria staff who received resources to participate in or become connected to field work have increased social and ecological awareness, as well as a better ability to communicate these issues to the public (Parker, 2014). Professional development for zoo keepers does exist - at a cost - in the form of workshops, certifications, grants, paid time off, and other supplements to their daily job. It is important to note, however, the U.S. Department of Labor (2016) reports the median animal keeper's salary as \$22,230 per year or \$10.69 per hour (not including non-wage benefits), which is only \$10,000 above the Federal Poverty Level for an individual (HealthCare.gov, 2017) and just under the proposed federal minimum wage increase of \$15.00 per hour (Sanders, 2015). As such, it appears financially prohibitive to participate in research projects or pursue professional development without the direct support

of their home institution's paid time off and/or educational funding. Moreover, the U.S. Department of Labor (2016) classifies zoo keeping with other animal positions such as pet groomer, veterinary clinician, and agricultural worker, making it challenging to provide the right resources at either an institutional or professional level. This fact also minimizes potential keeper contributions to conservation research. Before the start of this research, much of what was known about zoo keepers was anecdotal. Keepers work for the animals and for what many would consider a higher calling (Bunderson & Thompson, 2009) - but it can be said with certainty, based on their average annual salary, that no zoo keeper enters the field searching for financial success. Additionally, it would be hard to argue that in today's anthropogenically-threatened world zoo keepers aren't a necessity. Zooquaria and their keepers have saved many species from extinction, several of which can only be found in zoos and aquariums today (Keulartz, 2015). The AZA reports that more than 30 species have been "brought back

AAZK KEEPER FIELDWORK, PROFESSIONAL DEVELOPMENT, & FUNDING REPORTS

99.60%

Would take part in fieldwork with animals they currently work with

97.59%

Would take part in fieldwork with animals they do not currently work with

However, only

52.02%

responded "yes" to participating in field work related to their profession

60.24%

reported receiving funding from their institution for professional development or educational programming

82%

used funding to participate in zooquaria educational opportunities

52%

used funding to participate in field work

Across all levels, keepers were not likely to report receiving funding for professional development until they had been in the profession for at least

5 YEARS

from the brink of extinction" by zoos and aquariums. In fact, the estimated 180 million Americans visiting these zooquaria every year (Gussett & Dick, 2011) directly contribute to the \$216 million zooquaria spends on conservation projects (Association of Zoos and Aquariums, 2016). However, with decades of improvements for the animals in their care and conservation programs, zooquaria should now

look to the future – and the keepers – for the next step in their promising advancement.

The question remains: what is the overall benefit to zooquaria who provide keeper resources? The purpose of this research was to determine the demographics of the keeper population and who in that population receives resources through an online survey,

and suggest how they may benefit the field. Additionally, each individual respondent's ability to explain conservation issues was self-assessed. This research investigated existing support for professional development, educational opportunities, and funding for North American zoos and aquariums. In addition to the survey, AAZK Chapter presidents were asked to complete an interview. These Chapter leaders play an

integral role in the facilitation of their members' professional development, and therefore can provide unique insight into any current limitations to the field.

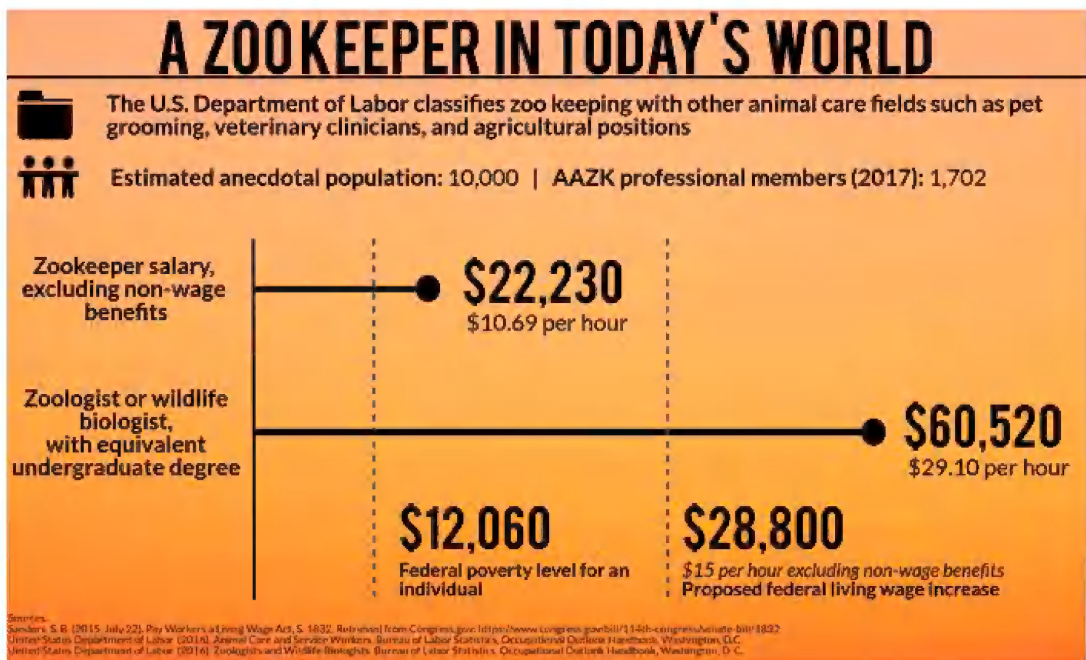
All responses from the survey and interviews were aggregated to express the significance of keeper resource allocation to zoos and aquariums. It was hypothesized that entry level keepers were not receiving the same opportunities as the more senior staff and that those keepers (regardless of seniority) who have received resources would be better able to communicate conservation messaging.

Methods

A survey of nineteen questions was created using Survey Monkey and made public between September 19 and November 10, 2016 (complete survey and results made available upon request to the author). It was sent via e-mail to 103 AAZK Chapters, shared on social media via the AAZK Facebook page, and advertised at The National AAZK Conference held between

19-23 September, 2016 in Memphis, Tennessee. The survey was approved by Miami University's Institutional Review Board in September of 2016, consent information restricted it to only those 18 years and older, and all identifying information including IP addresses were excluded. The targeted population were zoo keepers active in captive animal management in North American zooquaria and other related facilities. Topics for this survey included age, time in the zooquaria field, educational background, past professional funding, both resources provided and desired, and self-assessed conservation knowledge. Conservation self-assessment topics included palm oil, climate change, community-based conservation, capacity building, and suggestions for non-monetary or time contributions to conservation. The survey was comprised of yes or no, multiple choice, open-ended, and Likert-like scale questions. Results of the survey were analyzed for descriptive statistics and text analysis of open-ended questions; data was exported from Survey Monkey to Microsoft Excel.

AAZK Chapter presidents were separately interviewed on Chapter specifics including number of institutions represented, founding year, resources provided by home institutions and Chapter, Chapter-offered grants, Chapter contributions to field programs, barriers for members to participating in professional development and field work, reasons to join their local Chapter, and suggestions for requested resources from AAZK at a national level. The interview was approved by Miami University's Institutional Review Board in September of 2016, consent information restricted it to only those 18 years and older, and identifying information was removed upon receiving the responses. The interview was comprised of open-ended questions, included in the survey e-mail to all AAZK Chapters, and was available to be completed via e-mail response or over the phone. Responses were collected as aggregate information to add evidence to the survey.



Results

Survey Responses

The Survey Monkey link received 285 responses over fifty-three days. Results show 86.27% of respondents currently working at a zoo, 5.99% at an aquarium, and 7.75% at “other” The third category included the respondents’ fill-in responses of both zoo and aquarium, museum, education, wildlife center, nature center, conservation center, amusement park, marine park, educational outreach, sanctuary, non-profit facility, and resort with animals. The majority of respondents were between 25 and 34 years of age, female, identify as entry level keepers, and have been in the zoological field for five to nine years. Additionally, 91.94% of individuals surveyed currently hold or are completing an undergraduate or trade degree, 18.07% currently hold or are completing a graduate degree, and 3.23% hold or are completing a postgraduate degree. Respondents reported facility representation by the accrediting organizations of the AZA (87.41%), Zoological Association of America (1.75%), and other or none (7.34%).

Professional Development, Field Participation, and Funding

Of the survey participants 52.02% responded “yes” to participating in field work related to their profession, 67.34% participated in zooquaria-related conservation education opportunities (zoo school, certification courses, etc.), and 60.24% received funding from their facilities to participate in professional development or educational programming. Nearly all (99.60%) would want to take part in field work with animals they currently work with, and 97.59% would want to participate in field work with animals they currently do not work with.

Resources and Self-assessed Ability to Explain Conservation

Of the keepers who responded “yes” to receiving institutional funding, 82% participated in zooquaria educational opportunities, whereas only 52% participated in field work. The relationship between receiving resources and spending them on field work or educational programs was not reported. Keepers of all levels were not likely to report receiving

funding until they had been in the profession for more than five years. When compared to participating in field work, conservation education, and receiving funding, most respondents agreed to their self-assessed ability to explain four of the five conservation topics; the majority disagreed with their ability to explain the factors behind capacity building when making the same comparisons. When asked to offer advice to a zooquaria guest about ways to contribute to conservation issues, beyond time and/or money, 162 of the 285 (56%) respondents answered. The most frequently mentioned terms were palm oil, conservation, sustainable, and spread the word.

AAZK President Interviews

Of the 103 Chapter presidents contacted for interviews, seven responded with an average of 1.86 facilities in each Chapter and an average age of 18.43 years (current iteration of the Chapter). Six of the seven responding Chapters offer some funding for either general professional development or travel aid, whereas all of the facilities with the seven Chapters do offer some form of resource support. Presidents listed funding, securing time off, keepers not knowing where to find information or what opportunities are available, and lack of motivation as the most common barriers to participating in field work or educational opportunities. Additionally, requests to AAZK from the presidents included more readily available Chapter-building resources (finances, recruitment, retention, fundraiser ideas) and for AAZK to help professionalize the zoo keeping field (keepers role in conservation, not just skilled laborers, etc.). All questions were answered in each interview.

Discussion

Why the Results Are Imperative to Zooquaria

Until this research, most keeper demographic information was unknown or limited. This survey answered two important questions: who are the keepers and what do they need? Results of the survey showed that keepers are mostly mid-twenties to thirties professionals, in the first decade to fifteen years of their career (with movement to different

facilities not reported), and some form of undergraduate or trade school education. Likewise, the first official demographic survey for the AAZK membership since 1992 was completed in the spring of 2017 (Hansen), and the results agreed with this paper. The surveys showed that the same results were achieved through independent repetition. Both surveys implied that keepers hold the current education experience to meet the minimum standards of a becoming a zoo keeper (Association of Zoos and Aquariums, 2016) while likely placing an enormous financial constraint on the individual. The average annual zoo keeper salary is less than \$23,000 - roughly one third of the \$60,520 (or \$29.10 per hour) the average zoologist or wildlife biologist holding the same degree earns (United States Department of Labor, 2016). The results of the 2016 survey showed keepers don't report receiving funding until they're in the profession for more than five years; therefore, it appears that institutions only invest in keepers with more experience and/or in manager positions. This ignores the fact that entry level keepers lack many advanced skills required for promotions such as budget management or long-term strategic planning. Consequently, keepers not receiving financial support for professional development in the first five years of their career may be part of the reason they leave the field, which was suggested by the 2017 survey (Hansen); however further studies should be conducted to confirm this. While more respondents than expected had participated in fieldwork and professional development opportunities (52% and 67% respectively), future studies could explain how many of those resources were obtained through personal means - either taking personal paid (or unpaid) time off or through self-funding.

The last question in the survey addressed suggestions that respondents had for their guests contributing to conservation causes, beyond time and money. This is one of the most frequently asked, yet difficult, questions at zooquaria facilities. It is hard to connect with species living in drastically different ecosystems, and guests rely on keepers and other public staff to facilitate their pending support. Only 162 of the 285 respondents chose to

answer the question, either skipping it for convenience or lack of knowledge – suggesting that they may potentially be ill-equipped to answer the question in person. Most of the answers centered around being an aware and informed consumer and using resources wisely. These responses are a small sampling of the conversations keepers have with their visiting public daily, at the several hundred zooquaria institutions across the country and around the globe (Falk et al., 2007). When extrapolating these results and considering the 700 million people worldwide that visit zoos and aquariums every year (Gusset & Dick, 2011), this is a large opportunity to engage, educate, and inspire (Carr & Cohen, 2011). Considering zooquaria are striving to be modern centers of conservation education, keepers without consistent and informed messaging do a disservice to the individual facility, the field as a whole, and their guests.

Zooquaria Requirements and Expectations

Hiring practices and “keeper culture” are not consistent throughout different facilities, or even within similar regions or accreditation levels. There are many different zoo models (public, private, not for profit, etc.) that influence the types of keepers that are hired and retained, further depending on different background and skill sets of applicants. Even within the same animal department, hiring managers look for different skills that would best benefit the team and then can provide unique but targeted opportunities for development once an individual is hired. The zooquaria field itself has no written standards for vocational competency or promotional movement, other than what can be individually sought on one’s own. Meaning: there is no handbook for how to be the best keeper for the animals, resources are few and far between beyond anecdotes, and must be reviewed outside of the general work day. A search of either the AZA or AAZK jobs pages show vast differences between the requirements for all levels of keepers – entry level to upper management. There is no standardization for organizational structure, requirements, or organization of keepers – and this was reflected in the president interviews. Likewise, the president interviews (while not

a significant response rate of seven of 103 Chapters) showed that they believe both AAZK and individual facilities have a responsibility to be more consistent with one another and to make changes that reflect the latest research and standards. Moreover, the field as a whole needs to better integrate conservation with animal care by promoting zooquaria’s role in saving species. The presidents felt that the public is not aware of zooquaria’s role in conservation, and the actions of zooquaria need to be reflected through more effective public relation efforts. While AAZK, the AZA, and zooquaria facilities all actively strive for this goal, some do not believe the field is doing enough across the board.

Resource Support for Keepers

The AZA reports that annually around 90% of its 440 course attendees receive at least partial funding from their home institution (Rutherford, 2016). While this is a testament to increased institutional support since the AZA’s installation of the programming forty years ago, it is currently impossible to know the exact percentage of professionals receiving funding and support beyond that. Since the exact population of American keepers is unknown, if it is assumed that those 396 funded participants are part of the known AAZK member population of 1,702 individuals – 77% of the remaining AAZK population need to find alternate means of funding for either AZA or other programs. The presidents’ interviews listed time and money as the two largest barriers prohibiting their members from participating in both field work and professional development, with lack of resource knowledge in third. Presidents also stated that while their institutions offered funding and support, the resources are highly competitive. While this research showed that zooquaria might only be meeting minimum standards of thoroughly developing staff, it was revealed that management receives more resources, presumably as there are specific requirements they have to meet (i.e. attending species specific planning workshops). It may be more likely for entry level staff to leave the zooquaria field - but if zooquaria supply more resources they can encourage longevity, decrease turnover and they may keep the valuable staff

(and funds) they would have otherwise lost. When keepers (or managers) leave, more resources need to be used to educate and equip their replacements, therefore slowing down the allotted resource distribution for existing staff.

Existing Zooquaria Professional Development

There are examples throughout zooquaria of professional development but it exists in large part for upper management. The AZA has highlighted several programs that are fulfilling the need for more “home-grown” leaders, responding to facilities hiring top decision makers from external sectors (Collins, 2015). An article in the organization’s monthly publication showcased the Executive Leadership Program, which provides extensive education for selected existing leaders in the zoo and aquarium field, creating the next generation of CEOs and directors. This program reflects others from institutions across the country that support the continuing education of managers, but misses the entry level keepers – which is further reflected by the survey results. This potential top-down transfer of knowledge relies on management level employees, but the potential to do more does exist. There are, however, examples of institutional-based keeper support. The Denver Zoo offers internal opportunities for managers to advance while promoting collaborative and educational advances within the animal teams. The recently opened Toyota Elephant Passage saw the opportunity to create a new management style, whereby empowering its diverse team to collaborate, learn, develop, and travel (Kainuma & Murray, 2013). The “real-life experiences” not only enhance the role of the keepers on the team but link the Denver Zoo’s mission and values with exhibit messaging. They walk the walk and talk the talk.

Several west-coast facilities offer extensive educational and training programs, aimed at ultimately enhancing their guests’ experiences while also practicing what they preach (Shifflett, 2015). The San Diego Zoo’s Global Academy is offered to all staff, and provides structural and convenient programming to advance their mission

and staff education by: “...strengthening your skills, understanding your weaknesses, and becoming stewards of the zoo and aquarium community.” The Monterey Bay Aquarium partnered with the National Association for Interpretation to effectively tell the stories of their exhibits and conservation initiatives. The program is open to all staff, acknowledging that everyone from ticket takers to the CEO has the chance to express their “brand.” These programs encourage all staff to explore and develop new skills, thereby creating well-rounded staff and would-be future managers. Similarly, the ZooBright Scholarship Program for Woodland Park Zoo employees contains an endowment fund that “provides employees with the opportunity to apply for funds to

advantage of the system. Internationally, the European Association of Zoos and Aquariums (EAZA) and the European Union have partnered to create a “European Professional Zookeeper Qualification Framework” which aims at filling the gap in zookeeper skills and qualification (EZPQF, 2017). Through project partners, classes, and planning workshops, the program provides modules to help keeper staff across Europe “reach expected competency levels,” and allows for streamlined transitions to management positions or other facilities.

Alternate Support

If zooquaria facilities cannot financially support adding resources to their already tight budgets, they should seek to offer alternate support by

a tuition reimbursement program, monthly in-house conservation and research speakers, and is developing a keeper-given lecture series. The goal of this increased alternate professional development is to make the animal staff experts in their fields, while giving them opportunities to share their knowledge with their coworkers – creating a more stable and well-informed workforce.

Moreover, AAZK and other professional organizations offer grants and funding opportunities, but they can be more competitive due to a higher number of applicants than those resources offered by a single facility. Applications are often difficult to locate and can include complicated application processes, as indicated by the presidents’ interviews. Unfortunately, some AAZK Chapters also face barriers to their success when their home institutions consider them as “competing nonprofits,” crippling the Chapter fundraising efforts – and the professional experience that accompanies running those events. Chapter members organize and execute events to raise funds for conservation organizations as well as their own professional development, such as travel and education grants for their members. By making resources of all levels simpler to locate, providing application assistance, and supporting participation in local AAZK Chapters and other professional organizations, facilities can indirectly aid in the growth of their keepers.

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pursue professional development for continuing education and personal growth to continue the zoo’s mission (Remine, 2016). Award selections are made based on a review panel of endowment fund family members, zoo managers, and other employees, and require applicants to be in good standing, have worked at the zoo for two years, and are only eligible to earn up to \$3,000 per person. This funding process puts the power of choice back into the hands of the keepers; often other managers select what programs and projects their keepers will enroll in. Survey results show that the majority of respondents want to participate in field programs, both with animals they work with and those they do not. By supplying keepers with the aforementioned advancements, they are likely to select trips that support their professional development and ultimately the overall mission of their team and institution – with a review process weeding out any that would potentially try to take

looking within. From managers to veterinarians to horticulturists, and even keepers, there are likely many sources of informal education within the institution’s existing staff. It should be noted that occasionally offering these programs is insufficient to combat turnover, particularly among entry-level staff; providing frequent and diverse programming including lectures, workshops, and the promotion of small successes, have the potential to educate a great number of staff. The Maryland Zoo in Baltimore has embarked on a multi-year commitment to increase the number of professional development opportunities for their staff. In 2015 only 15% of animal department-sponsored trips were designated for non-management level keepers, but has rapidly increased to 40% and 52% in 2016 and 2017 respectively (Innes, 2017). Furthermore, the department supported one international trip for 2017 and have several more scheduled for 2018. The zoo itself also supports

Conclusion: Focus on the Parts to Better the Whole

By taking the lead from institutions offering professional development and funding for their keepers (and staff as a whole), the zooquaria field can start a new revolution. Keepers, managers, and zoos and aquariums are excellent advocates for their animals but don’t often speak for themselves. They often accept the status quo – it’s always been this way, so it’s good enough – rather than pushing the boundaries for their employees. The next evolution of the zoo keeper must include time management, organization, business skills, communication, emotional coping, and physical fitness. Keepers are no longer in a quiet position of the 9 to 5, but are rather complex problem solvers whose

physical day may end when clocking out, but often take their work home with them (mentally, physically, and emotionally). When zooquaria formally and adequately provide the resources the profession needs, they may finally be able to prove their worth to the scientific community and the general public (Fa, Gusset, Flesness, & Conde, 2014). This research provided basic data regarding the demographics of part of the keeper population and what resources they are receiving, but more studies should be done to determine what the entire keeper population looks like, what are current versus historical keeper turnover rates, and who is leaving the field versus moving to another facility.

Zoo keepers are known by nearly as many pseudonyms as the number of animals they care for: keepers, animal care professionals, aquarists, biologists, marine mammal trainers, herpetoculturist, aviculturist, etc. The enormity of their jobs cannot be defined, but rather summarized into all of the different hats they wear at any given moment. Zoo keepers are behaviorists, trainers, caretakers, match makers, innovators, teachers, fundraisers, advocates, and above all life-long problem solvers. To limit their possibilities is to limit the institutions that employ them, and ultimately the animals they work for. In a world of increasing operating costs and threats to the wild world, zooquaria need to come together to optimize spending while providing maximum resources for their staff. By providing resources such as professional development, education, and funding, zooquaria can empower their keepers to truly fulfill their calling: to save more wildlife and wild places than ever before.

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Captive Bat Management Turned Upside Down

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Disney's Animal Kingdom®

Lake Buena Vista, Florida, USA

Introduction

Among all North American zoos, the number of institutions that exhibit megabats (Pteropodidae) is, and always has been, proportionally low. However, this may not be the case for long as the taxon's popularity continues to grow. As such, the successful exhibition of megabats necessitates animal husbandry expertise. While the nuances of fruit bat care continue to evolve beyond a relatively short history, zookeepers should work diligently to communicate innovative strategies and best practices that can fill knowledge gaps to further advance the management of captive megabats, or moreover, captive bats as a whole.

Disney's Animal Kingdom® (DAK) is home to a small bachelor colony of twelve Large flying foxes (*Pteropus vampyrus*). Overall, large flying fox care at DAK is noninvasive in that situations which might require manual restraint are kept to a minimum. Traditionally, every individual in the colony received an annual physical examination in autumn. If no other circumstances required zookeepers' intervention, this single event may have been the only time manual restraint and weight measurement occurred. So, in 2009, zookeepers at DAK implemented a weight monitoring program that involved conditioning individual bats to voluntarily allow for weight measurements. A long-term voluntary

weight program for captive bats not only provides consistent and stimulating interactions during training sessions, but also the opportunity to generate a wealth of body weight data that can be utilized in many ways. Weight ranges across the species and across age classes within the species can be more clearly defined, individual bats in a dynamic group setting can be monitored more accurately, trends in weight loss/gain can be more easily identified, and future weight estimates can be more correctly extrapolated. But DAK zookeepers needed a specialized scale for such a specialized animal before any of these benefits could be realized.

The Scales

The first scale apparatus designed by zookeepers included a common digital scale that was inverted and fastened to rigid u-shaped mesh. This mesh was attached to any low ceiling in the exhibit space. A second rigid piece of mesh simply looped around the scale through the u-shaped opening and applied pressure to the scale when bats were hanging (see mobile scale photo). This scale's simple construction and mobility were advantageous, but the substantial height of the unit was probably the single biggest challenge. It seemed that only the most confident bats would venture to climb down below the unit to be weighed. Subsequent iterations of this type of "mobile" scale were

Cave Scale. Photo by Eran Brusilow





Box Scale. Photo by Nick Milone

improvements on the prototype, but were still too cumbersome. Additionally, the “mobile” scale was not a permanent fixture. So while some bats took to targeting near, and eventually onto, the apparatus, others were never exposed to the unit long enough to overcome their inherent shyness.

Experience had shown that a new design would have a better chance of success if it were permanent and more streamlined. The large flying foxes at DAK shift into a large guest-viewing exhibit most mornings, and into a climate-controlled night house most evenings. The narrow tunnel that connects both spaces is a bottleneck that zookeepers decided would be a

great location for a permanent scale. All of the bats are accustomed to shifting already, the ceiling is low so a scale wouldn’t be out of reach for zookeepers, and the unnatural shape of the “cave” scale might be easier to hide in the dark tunnel. The mechanics of the “cave” scale did not differ much from those of previous models. This new unit still incorporated a digital scale and a mesh framework to distribute a bat’s weight across the functional surface of the scale. But now, the design was thinner and incorporated the same materials that were already present in the cave (see cave scale photo). Large ropes dipping lazily through the tunnel provide the quickest path in both directions, and so pointing the bats in the direction

of the new scale was fairly easy. Some individuals move slow enough for zookeepers to read weights as the bats cross. More hurried bats can be stopped for a brief moment, with a quick treat or a subtle wave of the hand, while in position for weight measurement. In less than two weeks all of the bats had traversed the “cave” scale without incident, and within months zookeepers had passively obtained weight data from every individual bat at DAK.

The “cave” scale has proven to be very successful thus far. However, its limitations have spawned the creation of additional contraptions, namely the “perch” and the “box”, which permit DAK zookeepers to obtain weights in other situations too. The “perch” is utilized most by DAK veterinary hospital zookeepers when individual bats are required to stay at the hospital for medical treatments following injury or illness (see perch scale photo). Often hospital staff expect a slight but predictable decrease in bats’ weights during extended stays, presumably as a response to physical ailments and isolation in a new environment. Frequent weights not only allow hospital zookeepers to monitor the severity of this drop, but also allow veterinarians to calculate proper doses of medications using the most current weights. The increased frequency of restraint events associated with hospitalization (e.g., diagnostic tests, successive recheck evaluations, recurring bandage changes) is also a likely source of stress. The “perch” was created so that weights can be measured each time a bat is handled, without adding to the amount of time the bat is physically restrained. Large flying foxes can be transported between hospital holding areas by simply carrying the entire apparatus while the bats hang comfortably. The “box” is used most by DAK zookeepers when medical, social or environmental circumstances prevent bats from shifting through the tunnel and across the “cave” scale (see box scale photo). An individual that enters the “box” through the open side can be weighed by placing the cube directly onto a scale. While it may be possible to gently usher bats into position inside, DAK zookeepers prefer that bats voluntarily enter when the space is offered. Placing the “box” in favorite

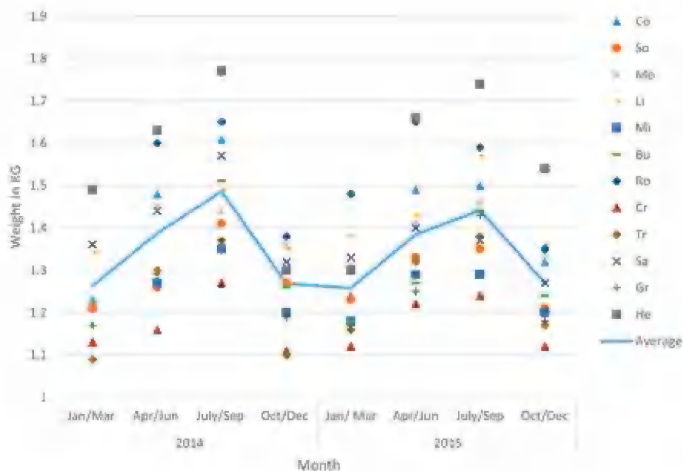


Figure 1. Average weights for 12 individual bats are plotted for each quarter. The line indicates the change in average weight within the colony per quarter over the two-year period.

roosting spots, or filling it with favorite foods can help speed the desensitization process. Currently, the “perch” and the “box” are only sporadically utilized, but DAK zookeepers are keenly aware of the tremendous value in motivating bats to use these tools.

Results

The voluntary weight program

progressed rapidly after the application of the “cave” scale in 2013; so much so that by 2014 zookeepers began collecting consistent weights on all of the large flying foxes at DAK. Over the course of two years, from January 2014 through December 2015, 438 individual weights from 12 large flying foxes were measured. Individuals’ weights collected during any given month were averaged to obtain one

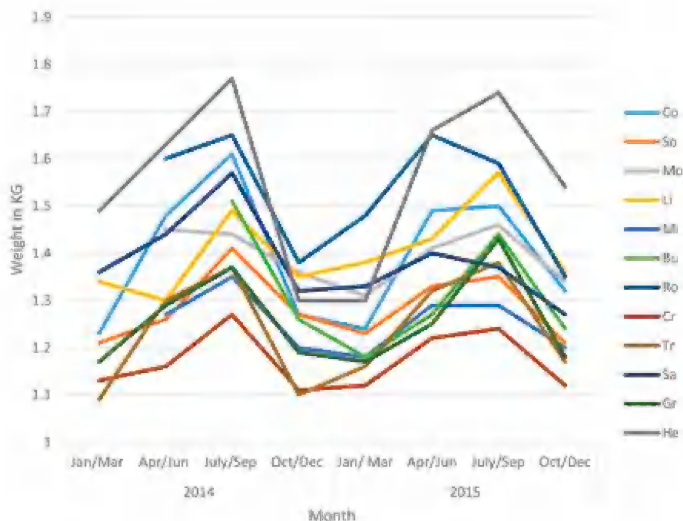
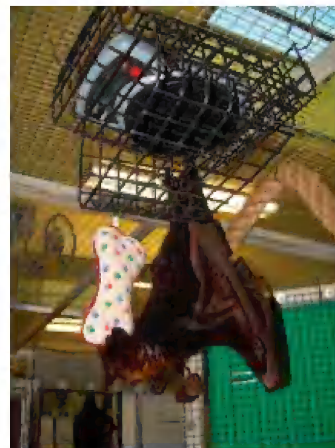


Figure 2. Each line represents the change in quarterly averaged weight for one of the 12 individual bats over the entire two-year period.



Mobile Scale. Photo by Angela Lebanik

data point per month per bat for most analyses. Rarely, an individual may not have had their weight documented during a particular month. Fortunately, analyses could also be conducted using averaged quarterly weights so that no bats were excluded. The quarters were defined as follows: January-March, April-June, July-September, and October-December. Analyses suggest that there is a repeatable pattern in weight fluctuations across the two-year window. Figure 1 shows a bimodal distribution of averaged body weights, with the two maxima occurring in the third quarter of both years. Figure 2 provides the weight trends for each individual bat, as opposed to a single line comprised of their collective quarterly averages. Notice that the lines for every bat are similar in shape when compared with one another, which provides compelling evidence for a significant effect correlated with seasonality. In 2014, average maximum body weight decreased by 18% before an upswing early the following year. In 2015, average maximum body weight decreased by 14%.

Conclusion

The development and application of different scale designs over the last eight years has proven to be a resounding success at DAK. Most importantly, a substantial amount of weight data collected from the bat colony validates zookeepers’ observations that the physical condition of individual bats



Perch Scale. Photo by Nick Milone

can vary dramatically throughout the year. In the late winter months male bats appear lean, and in the spring and summer the same males seem stout and robust upon visual evaluation. This seasonal pattern in male body condition is not unusual in other mammal taxa with polygynous mating systems (Welbergen, 2010) – pinnipeds (Beck et al., 2003), ungulates (Forsyth et al., 2005), sciurids (Koprowski, 2005), and ursids (Atkinson and Ramsay, 1995). It was first termed “fatted male phenomenon” (DuMond and Hutchinson, 1967) and is characterized as the increase in body condition prior to the onset of the breeding season. Strong evidence from studies involving grey-headed flying foxes (*Pteropus poliocephalus*) indicates that males also exhibit this “fatted male phenomenon”, and that the rate of change in body condition is positively correlated with territorial and sexual activity (Welbergen, 2010). The large flying foxes at DAK maintain territories in the main exhibit and in the adjacent night house all year, but they more aggressively scent mark and defend these territories during their presumed breeding season each autumn (Freeman et al., 2018). Although it seems plausible that parallels drawn from grey-headed flying foxes could apply to congeneric large flying foxes, historical weights at DAK provide strong support for such congruence. Additionally, zookeepers and nutrition staff now have the potential to adjust daily diet volumes based on trends in consumption across the entire year. Decreasing the total amount of food given when territoriality is highest minimizes waste of resources because the bats are too preoccupied to feed, and providing an above-average amount of food after the breeding season allows the bats to replenish fat reserves more quickly and improve overall health.

The discovery of these predictable shifts in body weight has also translated directly to the maturation of animal care and management strategies for the entire DAK colony. Consider that a seemingly obese bat was assessed by a veterinarian at the peak of its normal weight curve just before breeding season, in accordance with the “fatted male phenomenon.” Knowing whether or not this over-conditioned individual

is expected to lose body condition, as a matter of course, in the coming weeks could pay substantial dividends with regard to group and individual management. Large flying foxes are highly social and the removal of a single

Developing a weight monitoring program for the bats at DAK has helped zookeepers, zoological managers, veterinary staff and nutritionists better understand the dynamics of large flying fox husbandry...

bat can have major ramifications on the hierarchical structure of a captive colony. Historical weight data could also be analyzed to determine the best time of year to conduct annual physical examinations. Trends in body weight and body condition add context to the discussions between veterinarians and animal care staff, and offer considerable advantages when developing solutions to resolve medical concerns or adapt husbandry protocols. With particular regard to the psychological welfare of individual bats in the DAK colony, the implementation of this weight monitoring program has transformed a previous potentially negative situation (physical restraint) into an opportunity for enrichment and positive engagement. The stress caused by restraint can have a profound impact on the glucocorticoid levels of large flying foxes (Reeder et al., 2006). Elevated glucocorticoid levels do have beneficial metabolic effects in specific situations, but an exaggerated frequency of restraint for short intervals has the potential to cause chronically elevated hormone levels which could lead to hyperglycemia and other conditions (McGavin and Zachary, 2006).

Developing a weight monitoring program for the bats at DAK has helped zookeepers, zoological managers,

veterinary staff and nutritionists better understand the dynamics of large flying fox husbandry and has even sparked new investigations into the relationship between body weight and specific behaviors like roosting and shifting between exhibit areas. There is also potential, in the future, for DAK zookeepers to couple the visual evaluation of body scoring parameters like subcutaneous fat stores and muscle tone, with individual measurements of body weight for an even more precise assessment of physical condition. This will involve specialized training, but would serve as a wonderful opportunity to further the professional development of animal care staff. 🦋

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AAZK Professional Development Committee Call for Papers and Posters

**The 45th Annual AAZK National Conference
Indianapolis, Indiana**

August 18 – 22, 2019

Conference Theme: “Driving Animal Conservation”

Call for Papers and Posters

The AAZK Professional Development Committee is pleased to announce the call for papers and posters for the 2019 National AAZK Conference hosted by Indianapolis AAZK Chapter. The Host Chapter has chosen the theme “Driving Animal Conservation”.

Deadline for Submission of Abstracts for Papers and Posters: **May 1, 2019**

Authors will be notified regarding acceptance by **June 1, 2019**.

How to Submit Your Abstract for Consideration:

All applications must be received by submitting your abstract through Google Forms. Watch out for a link to the Google Form submission on AAZK Social Media and in your e-mail inbox! Or contact PDC@aazk.org to receive a link. If you do not use the Google Form application, your abstract will not be reviewed.

Papers

Authors will be allowed 15 minutes for a presentation with five minutes of Q & A immediately following.

Posters

Posters will be on display throughout the Conference with a scheduled Q & A session with the author. Posters will be judged by members of AAZK PDC on criteria such as adherence to the conference theme, innovation, and poster layout and organization. Certificates will be awarded to winning posters at the Awards Ceremony.

AAZK Sponsored Memberships Providing Resources to our Latin American Colleagues

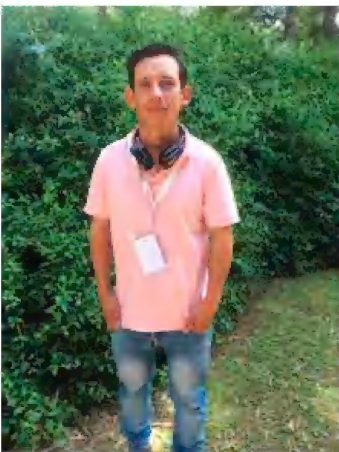
Yvette Kemp

AAZK International Outreach Committee Chair

As one of AAZK's newest committees, an International Outreach Committee (IOC) goal is to connect with our colleagues throughout Latin America to provide resources and support, offering a means for keepers to give optimum care to the animals they work with.

AAZK and the IOC initiated a program earlier this year inviting Chapters to participate in sponsoring an AAZK membership for 10 Latin American keepers. The response was amazing and, with the help of ALPZA (the AZA of Latin America) and our Mexico Teaching Programs, we were able to select five keepers from Mexico and five keepers from other parts of Latin America.

While I was attending the recent International Congress on Zookeeping (ICZ) conference at Fundación Temaikén in Argentina, I had the great surprise of running into two of the AAZK membership winners! Their names are Ricardo Andres Jimenez Gomez from Colombia (sponsored by the Los Angeles AAZK Chapter) and Alan Antonio Garcia Molinares from Ecuador (sponsored by the Dallas AAZK Chapter). I took the opportunity to interview them and learn a bit about their journey in the animal care world.



Ricardo Jimenez is new to the keeper world, having just started his position as a keeper at the Parque Jaime Duque Zoo in Colombia three years ago. He had completed the 9th grade and needed to work, so went to the local zoo to apply for a job. He had never worked with animals before but liked the idea and was offered a keeper position. He admits he did not know what he was getting into but immediately fell in love with the job and is happy to now call it his profession.

RICARDO

Ricardo works with reptiles, tapirs, flamingos, primates, and birds of prey. His facility has assisted his training by sending him to workshops around Colombia, covering topics related to primatology, husbandry, training, and anesthesia. He also attended a Shape of Enrichment workshop held at his zoo and was now attending his first ever, out of country conference at the ICZ conference in Argentina with his immediate supervisor.

Early on in Ricardo's career, he had an encounter with a boa constrictor that made reptiles his favorite animals to work with.

Early on in Ricardo's career, he had an encounter with a boa constrictor that made reptiles his favorite animals to work with. While feeding the boas, a 2-meter-long snake attached itself to his nose! He continued feeding the other snakes and then told his supervisor about the incident. He was not injured but he began researching the snakes and has loved them ever since.

I asked Ricardo what he would like to do as a keeper. His response was to learn how other facilities work. He would like to volunteer in zoos worldwide to learn more about zoo keeping and bring that information home to share with his co-workers. He would like to be able to communicate directly with keepers and visit their facilities to learn from them. He believes speaking directly with keepers and seeing what they do would be the best way for him to learn, but he would also be willing to e-mail to communicate with them (as best as they could) and get tips from them. He wanted to make sure I mentioned he does have a passport!

I also asked Ricardo how he has been using his AAZK membership. Since he doesn't know English, he has been slowly translating the AKFs and reading the articles. He says this is a good way for him to learn and practice English. He likes that the articles are written by keepers.

Ricardo would like to thank AAZK and his sponsor for considering keepers in Latin America. He would love for AAZK and the

IOC to lead a program at his zoo, so he and his co-workers could learn more. The IOC also hopes we can do that soon!

Alan Garcia has also been a keeper for three years and became a keeper when he started working at the Fundación Zoological del Ecuador. A friend had mentioned that the zoo was looking for gardeners, so Alan decided to apply. Instead of the gardener position, he was offered a keeper job

He would especially like to expand his academic and zoological knowledge and learn more about the zoo keeper world.

since he had worked as a vet assistant before. Alan currently works in the zoo's farm area and trains birds of prey.

He started working with large cats but was then moved to the farm section of the zoo. They were only covering basic training with the animals so Alan decided to develop a training and enrichment schedule. He also wanted to help with some of the welfare issues they were having. One of the ideas he came up with was to let the animals have access to larger areas, which they enjoyed. Not long after that, he was given the opportunity to assist with some of the birds of prey training.

Alan is now on the Training Team which works with injured wildlife that cannot be returned to the wild. Part of the training they do for these animals includes exercises to maintain the animals' physical and mental strength. They also use these animals for educational presentations and raise funds for their government run zoo by allowing guests to take photos. Besides caring for the injured wildlife, Alan is also training parrots and the farm animals, and has developed a presentation that talks about the difference between wild and domestic

animals. But Alan doesn't just train, he also performs general zoo keeper tasks and takes care of the feeder animals.

I asked Alan how having an AAZK membership helps him. His reply was that it helps increase his knowledge about animal care. There are resources relating to training, animal behavior and enrichment that he wants to read. He does not have any formal keeper training and would like all the information that he can get. He also believes he can apply the information he finds to their facility. It could help them develop projects at their zoo which can help unite the local zoos, the community, and provide education for everyone.

He would like to share what zoos are doing and work on what still needs to be done. He would also like to see more unity between zoos, keepers, and help them all learn what is "good" and "bad." He would especially like to expand his academic and zoological knowledge and learn more about the zoo keeper world. As a keeper in North America, I know there are many differences in how keepers are viewed. Although for us in the field it is a coveted job, we are sometimes seen as "poop scoopers." But most of the time, we are "rock stars" who have amazing jobs. Keepers positions in Latin America are very different. Most of the time, they are not given the resources and information needed to perform the basic necessities. Of course, that varies from facility to facility just as it does for us, but they definitely have many more challenges. Being able to count on a support system and resources is incredible and an AAZK membership along with a contact can make all the difference.

The IOC would like to thank all the AAZK Chapters who sponsored an AAZK membership for the keepers in Latin America. Our goal is to continue the program and increase the number of member sponsorships as well as uniting the keepers with their sponsor Chapters.



ALAN

If you would like to learn more about this and other IOC projects, please feel free to contact me at Yvette.Kemp@aazk.org.

Safety During Training

Training, as a tool to positively address the welfare of animals under human care, is receiving increased focus and attention as a part of zoo keepers' daily responsibilities. Regardless of the behavior, training is a complex task with multiple factors at play – creating opportunities for potential safety risks to go unnoticed and unaddressed. Safety for animals and staff is crucial at all times, especially during training sessions, and assessing risk factors continuously can reduce the rate of injuries or any potential emergencies that may emerge. Identifying and eliminating safety concerns saves time, resources, and creates an environment that is more productive for both trainers and animals alike.

Factoring Safety into Training

Training methods and philosophies may vary between institutions but having previously established safety requirements for training work is always beneficial. It is always important to follow these guidelines and requirements as established by certified and designated animal care and safety staff. Establishing these guidelines saves time by eliminating repetitive discussions about baseline safety requirements each time a novel behavior is trained. These safety protocols allow the trainer to create a more dynamic training environment and empowers them to respond quickly and appropriately to the animal's behavior as it arises. Having set safety requirements allows the remainder of the communication between staff to focus on the importance of the behavior and how it will be trained.

The primary motive behind safety during training sessions is to prevent injury to all trainers and animals involved, but the benefits do not end there. Safety considerations provide additional layers of injury and risk prevention for guests, facility staff, and animals not directly involved in the immediate session. Other benefits include reduced risk of animal escape during training, the ability to safely train animals for public demonstrations or interactions, and the opportunity to increase animal welfare. Zoo keepers can eliminate potential stressors or conditions that may create an environment in which the animal exhibits behaviors of discomfort. While some external factors are unavoidable (i.e. weather and crowd noise), keepers can identify stimuli or actions that act as stressors and adjust the session accordingly. The adjusted environment, and therefore more calm animals, can increase the productivity of the session in a way which is safe for everyone.

Photo 1: Free-flighted bird shows and other guest immersion programs are excellent ways to connect visitors to wildlife. Always consider animal behavior and environmental factors to ensure safety throughout the encounter. (Photo courtesy of Zoo Atlanta)



Who Should Make Safety During Training a Priority?

To keep things simple, everyone involved in training should keep safety at the forefront of their minds. It doesn't matter if the animal is considered domestic or dangerous, safety is applicable across all species. Situations can escalate quickly, and animals not considered dangerous can exhibit dangerous behaviors under certain circumstances. By considering safety equally, regardless of the animal, trainers decrease the risk of accidents. An accident, irrespective of the severity, can make all the difference between a behavior being deemed "too risky" or "not safe" for a zoo keeper to train.

Those who take on the role of primary trainer when training novel and

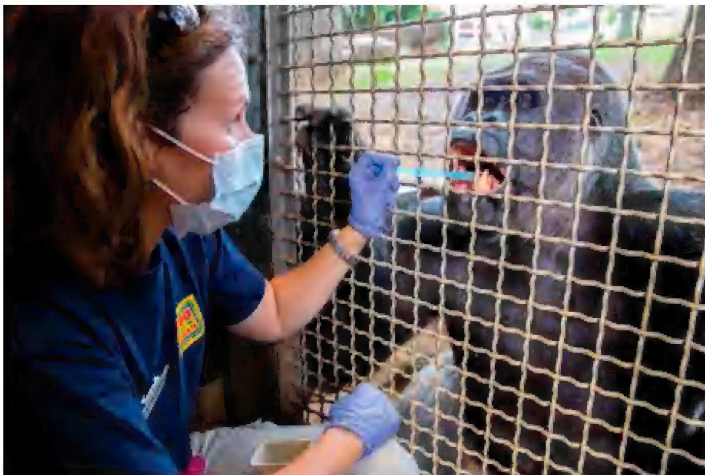


Photo 2: The position of the trainer is important in protected and free-contact settings. Be cognizant of the animal's ability to access the trainer or training instruments used during a session. (Photo courtesy of Zoo Atlanta)

established behaviors should consider all safety risk factors involved with the behavior, the animal involved in the session, and what can be done to decrease or predict any risks prior to training. Consulting with managers and other zoo keepers who work with the animal ensures that facility guidelines are being met and provides the opportunity to identify risks that may have been overlooked initially. Training new behaviors can be an exciting and challenging process and discussing with coworkers is a great team building opportunity and learning experience for everyone.

It is also important to remember that not all those who are involved in training sessions are those who work with the animal every day. Consider the interaction level each person involved has with the animal being trained (or their animal experience in general) and the safety precautions necessary for them to effectively execute their role. For instance, veterinary staff are properly trained and certified to perform the medical portion of the behavior (i.e. blood draws and ultrasounds), which is where their focus will be. These procedures usually mean an increased number of people in animal buildings and spaces, so zoo keepers should assess how a building is set up and where people can observe or participate from safely.

Communication is key in these situations and staff who are appropriately trained to work with the animal on that behavior should communicate to veterinary staff how to proceed safely with the session in response to the physical environment and animal's behavior in the moment. Additional considerations include building exits, where emergency equipment is stored, and constantly acknowledging human position in relation to the animal during the session. It is also important to identify where other animals in the building are located, particularly when training an animal which is sharing a space or in an adjacent space. Knowing the individual behavior of the animal involved in the training session can also be a key safety tool and it should be acknowledged and discussed if there are any concerns that may affect the safety level of the session. This can include aversions the animal may have to sounds medical equipment makes, the presentation of a needle, etc.

In some cases, animal care teams and veterinary staff are not always the only ones to frequently handle or interact with animals in their care. For facilities with volunteers or education outreach staff that regularly handle animals, whether it be for husbandry purposes or guest interactions, it is important to keep all handlers up to date on proper safety techniques. An efficient way

to do so is to provide up-to-date fact sheets on all individual animals being handled. These sheets can include the species' anatomical capabilities, such as a raptor's grip strength, as well as any behavioral changes, dispositions, or medical conditions that may affect how the animal may reasonably respond to any stimuli and is subsequently handled. This should be done by someone who is properly trained or certified to do so as designated by the institution and can be an effective safety tool for volunteers as well as paid staff.

General Steps to Take to Ensure a Safe Training Session

Once the safety requirements of the behavior have been identified, there are additional steps zoo keepers can take to ensure a safe training session for everyone.

Gathering Equipment Before Starting a Session

Gathering all equipment needed for the session before it starts not only saves time, but it also keeps focus on the training being conducted and safety measures already put into place. Having all tools prepared and ready in the area where the training will be conducted eliminates having to make trips back and forth, securing or un-securing doors to get to the equipment needed, and the added potential for distraction. Gathering bridging tools, reinforcement, target poles, etc. beforehand leaves the trainer's full attention on the session, the animal, and the behavior being trained. Training sessions are already complex tasks and taking this extra step of preparation beforehand eliminates an avoidable distraction.

Properly Using the Equipment Involved in a Training Session

If equipment is being used during a training session, it is important that trainers and other staff involved know how to handle it properly. This is especially critical for medical equipment such as blunt needles or blood pressure cuffs and is also important for something as simple as a wooden dowel or target stick. Does the animal have the capability to push the tool back towards the trainer and injure them? Is there a way that the trainer can position their body to



Photo 3: During all training, whether it be protected or free-contact, it is important to know your exit routes as well individual animal behavior. Having a plan and recognizing behavioral cues both prevent safety from being compromised. (Photo courtesy of Zoo Atlanta)

eliminate that risk? Or is the behavior being trained in a way that the animal can't gain possession of the tool and injure itself or conspecifics in the same area? These may be simple questions to ask, but they are easily identified precautions that could potentially cause trainer or animal injury if not addressed. Only those who are certified or trained to handle medical equipment should do so. This person may vary depending on the facility, but it is important that proper and safe handling is exercised. Likewise, it is good practice to treat prop items (i.e. blunt needles) like the real item. This includes proper handling, storage, and disposal. Also, despite their lack of functionality as an actual piece of medical equipment, props should be very clearly labeled as such in a way that is easy and clear to see. While writing "prop" on a medical training object (or designating it as such according to a standard and universally recognized labeling protocol) might not seem like a necessary precaution, incorrect labeling and storage can create a large problem in emergency situations when decisions need to be made quickly.

Communication is (Always) a Strong Safety Tool

Communication is important in all aspects of the animal care field and crucial to safe training sessions. One

of the easiest steps to take to help ensure a safe training session for everyone is to alert others in the area that a training session is going to occur. This is particularly true in situations where shifting or perimeter doors will be opened - creating risk for animal escape during the session. In areas where multiple staff members are working independently, the opportunity for distraction as a safety risk is high. A distracted animal, at best, may simply result in loss of attention. At worst, it could spook an animal resulting in injury to itself, conspecifics or staff due to flight response. A simple radio transmission, telephone call, or verbal communication to others that are in or may enter the area helps decrease those risks.

In situations that involve frequent opening and closing of transfer or shift doors, additional safety precautions as part of shifting protocol must be observed. In addition to alerting coworkers that a training session is about to occur, ensure that perimeter doors are secure. This eliminates having to radio a coworker each time a transfer or shift door is opening or an animal is moving from place to place in a dangerous animal area. Another communication tool includes easily mounted signage readily

available in all animal areas that can be displayed to indicate a training session is taking place. The signs can be short and simple, such as "Training in Progress" or "Radio (insert animal here) zoo keeper before entry" and placed on security doors into the area. This is a friendly reminder to coworkers to exercise caution and communicate that the space is indeed safe to enter. This can be especially useful in complex buildings with multi-use spaces. It can be habit to get into a routine of how each day typically goes and the reminder from a sign may make all the difference in keeping a safety error from occurring. Standard communication protocol allows trainers to maintain focus on the session and the behavior being trained, and reduces risks of animals having access to areas they shouldn't or breaching containment barriers.

Guest Programs and Interactions

For many zoological facilities, guest interactions, demonstrations, and immersion programs are a useful tool to engage and inspire visitors. For these programs to be effective and maintain the highest standards of animal welfare, they must be executed safely. For example, during free-flighted bird shows, what are the requirements for the birds to be able to safely leave their primary containment areas? Consider the temperature, current weather, and the weather forecast during the duration of the show or interaction. Unfavorable conditions may not be safe for the birds, trainers, or guests involved in the case of a fly-off or distraction during the show.

When handling program animals or involving animals in up-close encounters, it is also important to remember that crowds cycle. Make sure to reiterate the rules of interacting with the animal every few minutes and demonstrate the proper and safe way to do so. With large crowds, or during public training demonstrations, it may not be possible for one person to pay full attention to the animal while also interacting with guests. More often than not, there is extensive benefit to have multiple trained staff members present; the number necessary to focus



Photo 4: Animals of all sizes can become dangerous under certain circumstances. Assess and establish safety parameters for all animals prior to beginning a session. (Photo courtesy of Zoo Atlanta)

exclusively on the animal and others to safely manage and effectively educate guests. This allows for full attention on the animal from the trainer(s) and leaves the opportunity for the other(s) to talk about safely interacting with the animal or answering any questions guests may have. In any situation where guests are closely interacting with animals, with or without a protective barrier, the safety requirements for doing so need to be clearly and concisely communicated by trained staff.

Context Matters: Understanding the Animal and its Environment

Analyzing how to safely train in each environment is an important tool for all animal care professionals.

Think about the animal being worked with, both as a species and as an individual. Animals that tend to be more affected by sudden changes in their surroundings are particularly important to consider. For example, in situations involving prey animals such as hoofstock, where the animal can easily spook, standing position and proximity to extremities can be very dangerous. There will always be external stimuli outside the zoo keeper's control. For instance, flying objects overhead may

trigger a flight response and the proper positioning of the trainer and animal can make all the difference in preventing injury to the trainer, the animal, or any of its conspecifics.

Furthermore, a barrier is not an automatic safety blanket and the possibility for injury to trainer or animal is always there. Once again, knowing the capability of the animal being worked with is critical. Can the animal pass the plane of the barrier with any portion of its body? If so, is the trainer's body positioned in such a way

that they will not be harmed in the case that this occurs? Being aware of general body placement in these situations is important because a simple shift in weight by the trainer could put hair, lanyards, uniform sleeves, etc. within reach.

Also assess if the animal has the capability to compromise its own safety while being asked for certain behaviors. For example, when training an open mouth behavior, an animal might hook its tooth on the barrier, putting itself and the trainer at risk of injury while attempts are made to unhook it. Always keep animal and trainer safety in mind and brainstorm with team members and managers on how to not reinforce behaviors that compromise safety.

Conclusion

The ability to incorporate safety into training is a handy tool for all animal care professionals to have. To reach individual and team goals set for animals in human care, zoo keepers should always take the necessary steps to ensure safety for all involved during a training session. A safe work environment is a productive work environment not just for zoo keepers, but for all staff, guests, and animals at a facility. Furthermore, it empowers zoo keepers to respond effectively in the moment and expands the possibilities for future training work. 🦋





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